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Review article

Cupping therapy: A prudent remedy for a plethora of medical ailments

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ABSTRACT

Since ancient times, complementary and alternative medicine (CAM; 補充與替代醫學 *bǔ chōng yǔ tì dài yī xué*) have played an important role in human health and welfare. Many therapeutic approaches in healthcare outside the realm of conventional medicine persist in various parts of the world. There is considerable scientific and commercial potential in CAM, which needs to be explored precisely. Cupping therapy (拔罐療法 *bá guàn liáo fǎ*), one of the CAM, is practiced across the world. This therapy is believed to act by correcting imbalances in the internal bio field, such as by restoring the flow of "Qi (氣qì)". Cupping involves applying a heated cup to generate a partial vacuum that mobilizes the blood flow and promotes effective healing. This review outlines various tools and techniques of cupping therapy.

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1. Introduction

Complementary and alternative medicine (CAM; 補充與替代醫學 *bǔ chōng yǔ tì dài yī xué*) is well recognized across the world and within every culture. CAM is an umbrella term that encompasses a vast array of treatment options supplementing conventional therapies, to help ease symptoms. CAM therapies address a very large pool of diseased conditions. They provide a platform which plays a paramount role in human health and welfare. As these are frequently used in people to improve health, it is essential to explore their scientific and biomedical scope. Cupping therapy (拔罐療法 *bá guàn liáo fǎ*) constitutes one of the CAM therapies, known to carry a remarkable potential in various maladies. A detailed picture of cupping therapy is portrayed in this review so as to understand its existing mechanisms and pharmacological actions and rejuvenate its relevance in current medical scenarios. Cupping therapy is a part of CAM and an ancient form of alternative medicine. It is practiced with round glass cups that are shaped like glass balls, which have an opening at one end. This treatment involves placing glass suction cups on painful body parts for vacuum creation which would restore the flow of "Qi (氣qì)". Cupping is a simple

application of quick, vigorous, rhythmical strokes to stimulate muscles and is particularly helpful in treatment of aches and pains of limbs, head, neck, shoulders and back. Thus, cupping carries the potential to enhance the quality of life.

2. Cupping, an old medical therapy

There are numerous reports mentioned in the history including Herodotus (a Greek historian, 400 BC) prescription related to wet and dry Cupping therapy (拔罐療法 *bá guàn liáo fǎ*) for treatment of headaches, lack of appetite, maldigestion, fainting, abscess evacuation, narcolepsy, and others.¹ It also finds a mention in the famous Egyptian *Papyrus Ebers* (1550 BC) in the west and ancient Greek medicine. Hippocrates (Greece) preached the cupping based treatments related with musculoskeletal diseases of the back and extremities, gynecological complaints, pharyngitis, ear ailments, and lung diseases. Cupping therapy is popular as 'Al-Hijama' in Egypt and Arabic countries. It is an intervention of Asian medicinal systems such as Unani, Ayurveda, Chinese, Tibetan, and Oriental Medicine in Asia, the Middle East, and European countries. In Europe, cupping therapy was customarily used by monastery practitioners and folk healers up to the 19th century.^{2–7} Scientist Celsus advised local cupping for abscesses and as a means of extracting poisons from bites made by man, apes, dogs, wild animals or snakes. In the early 2nd century, scientist Aretaeus used both wet and dry cupping, but preferred the former to treat prolapse of the uterus and cholera ileus and epilepsy. Galen was a great

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proponent of the method and described various cups of glass, horn, and brass.⁸ Horn cupping and bamboo jar therapy were derived from cupping therapy principles.⁹ Dry and wet cupping are commonly practiced in the Far East, Middle East, and Eastern Europe as well.¹⁰ Thus, cupping therapy maintains a strong historical account that needs to be rejuvenated in modern times.

3. Methods of cupping

Cupping therapy (拔罐療法 bá guàn liáo fǎ) belongs to a 2000-year-old Chinese traditional medicine system. There are 10 types of different cupping methods viz. weak/light cupping, medium cupping, strong cupping, moving cupping, needle cupping, moxa/hot needle cupping, empty/flash cupping, full/bleeding cupping, herbal cupping, and water cupping.¹¹ Traditionally, cups were made of glass, metals or even bamboo.¹² A gourd was explored as the medium for cupping by ancient Greeks.¹ Since these traditional cups do not allow the complete cupping of big joints, a modern technology of pulsatile cupping was developed that generates a pulsatile vacuum for complete cupping. Silicone cups allow comprehensive cupping of big joints along with flexibility in therapy.^{1,12} Different shapes of cups are available from balls to bells in variable sizes, ranging from 25–75 mm across the opening.¹³ Across the world, different types of cups are available for cupping which are listed in Table 1.¹⁴

Based on the application of cups, cupping therapies are classified and described as in Fig. 1.^{7,15}

It is the most commonly used method in Chinese medicine wherein suction is generated by use of a flame. Dry cupping is a technique of bruising the skin painlessly, in which the bottom of a glass cup is rinsed with methylated spirits, set alight, and planted over the skin. The flame exhausts the supply of oxygen, causing a partial vacuum and the skin is sucked into the mouth of the glass. Retained cupping is utilized to stimulate mammary glands for improving milk ejection. It also assists in healing of wounds via quick pus discharge.^{15,16} It contains two steps: (1) prior to the application of suction, small incisions are made with a triangle-edged or plum-blossom needle to the cups; and (2) an acupoint is firmly tapped for a short time to cause bleeding. In the case of wet cupping, prophetic medicine, honey is applied locally to fix the cups, as well as for the skin scarification, hence enhancing the rate of healing.¹⁷ Wet cupping involves two different application methodologies, viz. cupping, puncturing and cupping (CPC) method. CPC progressed with six steps of skin demarcation, sterilization, cupping, puncturing, cupping, and sterilization. This method is commonly used in Arabic nations^{18,19} to treat the various disease conditions. The puncturing and cupping (PC) method followed five steps of skin demarcation, sterilization, puncturing, cupping, and sterilization. The PC method is common in China, Korea, and Germany.^{20,21} In this method, practitioners need to control the suction by gently moving the cup in one direction.²² On comparing the cupping across the meridian running direction and that against the running direction, similar local effects were observed. Dual-directional moving cupping is applicable for the treatment of local disorders. The abscopal effect is better with moving the cup against

the meridian running direction.²³ When cups are removed after suction without delay, then it is called empty cupping.²²

In needle cupping, acupuncture is applied initially with subsequent deposition of cups over the needle. Medicinal/herbal cupping makes exclusive use of bamboo cups wherein the herbs are boiled as aqueous dispersions followed by application of suction on specific points.²² The acupuncture method merged with cupping works by the following mechanism – small needles inserted into the skin will contact tension points and thereby relieve the pain. It is widely accepted as a safe therapy, even though the probability of complications such as trauma or infection persists.²⁴ The length of needle retreat in cupping depends on the patient gender and the negative pressure of cupping.²⁵ Water cupping comprised filling a glass or bamboo cup with one third warm water and pursuing the cupping process in a rather quick fashion.²²

Each kind of cupping therapy finds use in different ailments. Since cupping is widely used in Chinese folklore culture, the technique has been inherited by the modern Chinese practitioners. In cupping, the heating power of flames aids in achieving suction (negative pressure) inside the cups which have to be employed on the desired part of the body.²² In sham cupping, a small hole to reduce the negative pressure after suction aids in maintaining the inner pressure for real cupping therapy, but yet more rigorous research calls for safe use of this device.²⁶ Sliding cupping involves three steps viz. (1) the local area of pain, or the affected channels and points are lubricated; (2) the cup is applied; and (3) the cup is made to slide up and down until the skin becomes hyperemic. This is known to resolve the disturbed functions of Zang-fu via a dual mechanism of cupping as well as massage. Zang-fu is a collective term for internal organs; five *zang* organs encompass the heart, liver, spleen, lungs, and kidneys and the six *fu* organs contain gallbladder, stomach, small intestine, large intestine, urinary bladder, and sanjiao (the triple energizer).²⁷ El Sayed et al described cupping therapy in the form of 'S' techniques, as depicted in Fig. 2.²⁸

In *Ayurveda*, Acharaya *Sushruta* explained the principle of *Pradhanakarma* (main procedure) to treat various diseases wherein 'Raktamokshan' is one of its functions that resembled the cupping therapy. Raktamokshan therapy implied the refinement of blood by removing toxins from the bloodstream. The main aim of this therapy is elimination of vitiated blood from the body. Detailed information about raktamoksha therapy is explained in Fig. 3.^{29,30}

4. Mechanism of cupping therapy

Qi (氣 qì) permeates everything which is not only the vital energy of life but also the transferable energy. It is the quality attribute that determines the state of one's health and life span. Yin (陰 yīn; negative/passive/dark/water) and Yang (陽 yáng; positive/active/bright/fire) are customary medicinal traits, central to Taoism. Both contain seeds of each other, conflicting as well as in equilibrium with each other.³¹ Cupping therapy (拔罐療法 bá guàn liáo fǎ) is valuable in restoring the balance between Yin-Yang by strengthening the body resistance, ejecting the pathogenic factors, and promoting blood circulation to alleviate the pain.³² Cupping helps to extract blood from the body which may be harmful and in turn, overcome the potential adverse effects, leading to physiological well-being.³³ In cupping therapy, a cupping glass is applied to a predefined skin area, and a vacuum is generated by mechanical withdrawal or thermal cooling of the entrapped air under the cup. The skin is then dragged into the cupping glass, resulting in rubor and heat at the affected area with increased perfusion.¹² Also, flaming is used for suction (minus pressure) inside the cups, so as to apply it promptly on the desired part of the body. Cupping is thought to act mainly by increasing local blood circulation and relieving the painful muscle tension. It mainly involves improving microcirculation, promoting

Table 1
Types of cups explored for cupping therapy and their origin.

Cups	Region
Round glass cups or bell shape cups	Japan
Buffalo horn shape cups	North America
Hollow animal horn shape cups	Europe, Asia, Africa, and North America
Mouth or buffalo horn shape cups	Iraq to the Mediterranean (Assyrian Empire period)
Shell shape cups	North America (specifically near Vancouver Island)

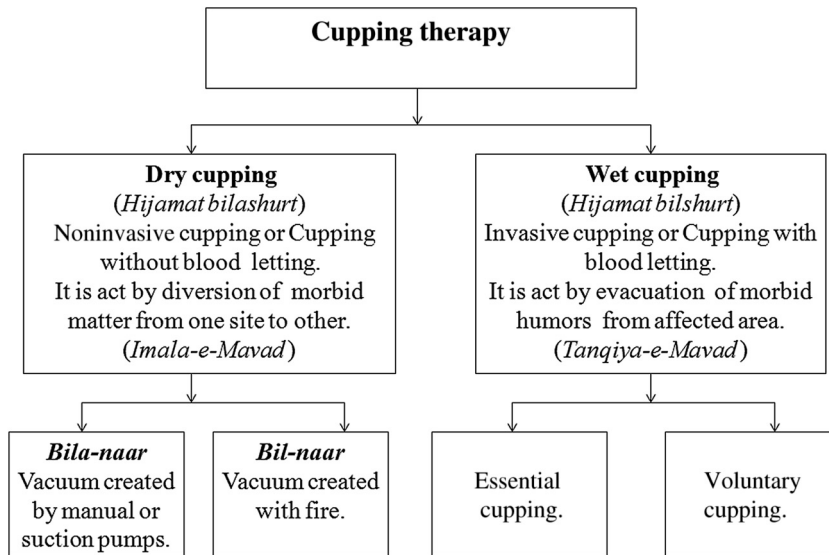


Fig. 1. Classification of cupping therapies.

capillary endothelial cell repair, accelerating granulation, and angiogenesis in the regional tissues. This helps in normalizing the patient's functional state and progressive muscle relaxation.^{34,35} In traditional Chinese medicine, cupping plays the role of leak or purging.³⁶ Cupping is the best deep tissue massage.³⁷ It is able to provide the tapotement (massage stroke) to the body. Tapotement is a quick, vigorous, rhythmical stroke, obtained to stimulate muscles similar to other therapies like tapping, hacking, slapping or pummeling.³⁸ In order to investigate the actual mechanism of cupping, Emerich et al measured in parallel, the metabolic changes in the tissue under the cupping glass and pressure pain threshold. It was found that cupping is able to increase the lactate/pyruvate ratio after 160 minutes, indicating an anaerobic metabolism in the surrounding tissue with immediate increased pressure pain thresholds in some areas. After 280 minutes, no further significant changes of pain thresholds were detected.³⁹

5. Application sites

Various regions of the body on which cupping is effectively applied under diseases conditions are the back or neck, at the

interscapular region, at the right and left carotid, at the lateral side of the neck, at protuberance behind the ear, the middle and crown of the head, at the chin, at the thighs or folds of the thighs, at knee joints, at ankle joints, at the breast, at hips or buttocks, at the anal area, at wrist joints, at ear tragus, and at shoulder joints.²¹ The back, chest, abdomen, and buttock, areas of abundant muscle are the most common sites on which the cups are applied.⁴⁰ The cups are typically left in place for 5–10 minutes, or sometimes more. Owing to vasodilatation and edema, histological changes are observed in the skin without any cellular infiltrate. The after effects of cupping often include erythema, edema, and ecchymosis in a characteristic circular arrangement. Most of the local skin changes subside within a few weeks.¹³

6. Pharmacological actions

Cupping as a complementary therapy helps many patients beyond the pain resolving treatment. There are various indications of Cupping therapy (拔罐療法 bá guàn liáo fǎ), especially joint pain, back and neck pain, arthritis, abscess, facial paralysis, and other physical health ailments. With modern technology impinging the

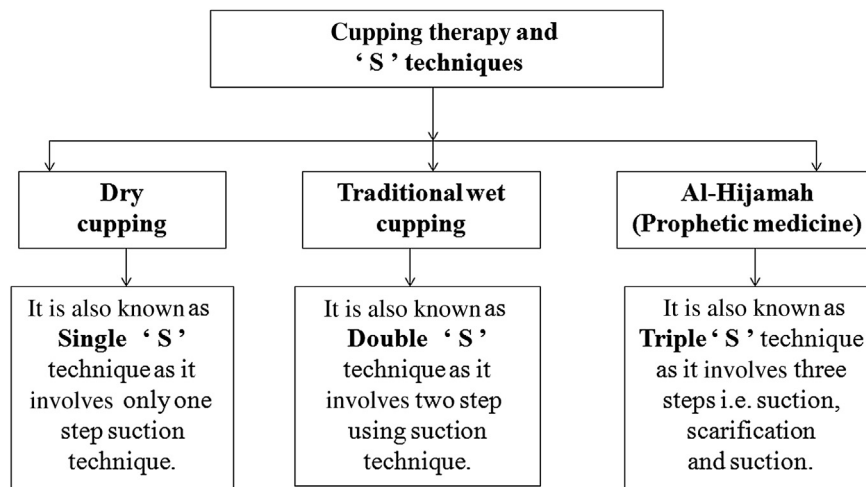


Fig. 2. Cupping therapy and 'S' techniques.

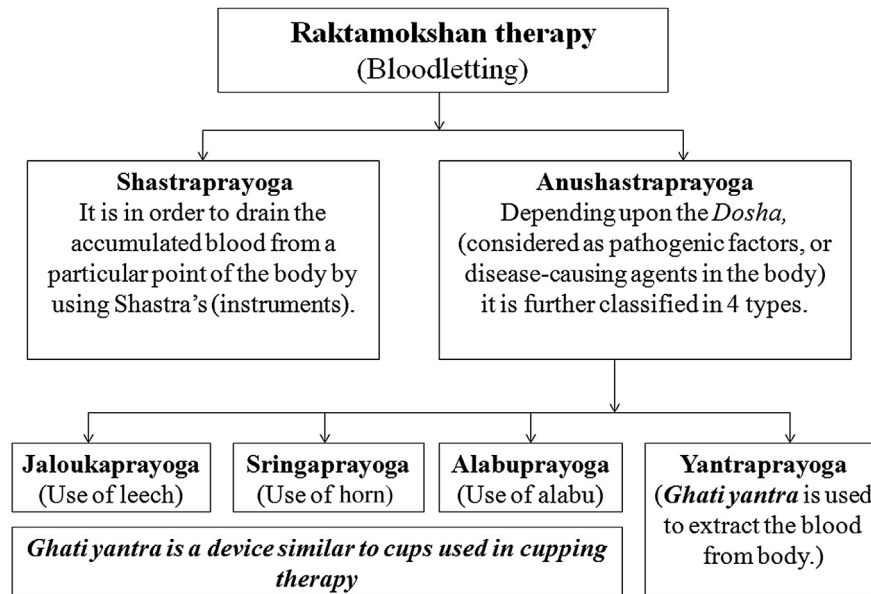


Fig. 3. Raktamokshan therapy and its types.

world, cupping therapy is also transforming into a better version. A favorable balance between various vital parameters after Cupping therapy (拔罐療法 bá guàn liáo fǎ) is restored by a specific mechanism.²⁰ Cupping therapy helps to align the skin blood flow which is more obvious near the cupping area.⁴¹ It involves the removal of impure blood from superficial areas of the ailing parts. The cupping sites are more or less specific to the ailments of the patient and the number of cups varies from patient to patient, depending on the patient's condition and the cup size.⁴² In the case of cardiac diseases, cupping therapy showed a cardioprotective action in an ischemic reperfusion injury model of rats.⁴³ Huber et al suggested that cupping is reproducible if the exact method is described and followed per se.³ Various pharmacological actions of cupping therapy are given in Table 2.

Cupping therapy is also useful in various conditions like gout and other forms of arthritis,¹ lumbago,¹⁰⁴ and as epithelial grafts for vitiligo management.¹⁰⁵ It is also commonly used in reducing pain, and muscle tenderness, and improving a range of motions.¹⁰¹ Cupping therapy is not limited only to the above pharmacological actions, but it is also helpful in regulating both innate and acquired immune responses.¹⁰⁶ By comparison, wet cupping therapy was found to be better than dry cupping therapy, because it is able to eliminate the causative pathological substances (CPS) and restore the normal physiology, while dry cupping therapy depends on dilution and redistribution of CPS to new sites.¹⁸

7. Snags in cupping therapy

While Cupping therapy (拔罐療法 bá guàn liáo fǎ) offers many benefits, it also causes adverse effects.¹⁴ In a study related to cupping therapy, Jiang and Liang suggested that the principle, indications, and contraindications associated with the cupping therapy depend on the type of cup, application, and frequency of cupping. Cupping therapy application ranges should be clinically well defined.¹⁰⁷ When psoriasis was treated by cupping therapy, subsequent development of the Koebner phenomenon at the cupped sites was observed. Cupping can induce both epidermal cell injury and dermal vascular damage in terms of abrasions, ecchymosis, and purpura.¹⁰⁸ High serum cholesterol is an important risk factor for cardiovascular

ailments during wet cupping. However, it does not have a significant effect on anthropometric or biochemical indices.¹⁰⁹

During the cupping of the cervical area, the tensile radial stresses generated by cupping may potentially facilitate the development of a dissection in the presence of an intimal tear. This may cause hemorrhagic stroke with an acute rise in blood pressure. Moreover, the possible presence of microinclusions can intensify the local stress concentration for a thin cup.¹¹⁰ When applying cupping and acupuncture together, a rare complication of epidural abscess appears. To avoid such complications, therapists must be aware of individual human physiology.¹¹¹ Cupping is particularly not advised over excoriated, oozing or infected areas¹¹² as it may enhance D-dimer (a fibrin degradation product) levels.¹¹³ Appropriate precautions and guidelines as well as hygiene throughout the cupping therapy aid in preventing related side effects. Cupping leads to red marks, swelling, and bruising as blood is drawn to the surface of the skin. Panniculitis (inflammation of panniculus adipose, especially of the abdomen) is one of the serious side effects of cupping therapy.¹¹⁴ As cupping encourages blood flow to the cupped region (hyperemia), one may therefore feel warm as a result of vasodilatation and slight sweating may occur. Cupping therapy is contraindicated in deep vein thrombosis.¹¹ Wet cupping therapy carries a risk of skin infections.¹¹⁵ Bloodless cupping is particularly used to treat muscular tension and musculoskeletal pain, such as chronic neck pain.¹¹⁶ Specific procedures should be adopted for bloodletting therapy to avoid anemia as a result of blood loss.¹¹⁷ Application of dry, wet, and other types of cupping therapies may cause bleeding, skin bruises, keloid (an area of irregular fibrous tissue formed at the site of a scar or injury) scarring and burns owing to deep long scarification, excessive suction pressure, dermal capillary rupture, and suction with use of cotton or alcohol ignition, respectively.¹¹⁸ Weng et al¹¹⁹ reported hemophilia A in one of the patient undergoing traditional Chinese wet cupping therapy.¹²⁰ One of the major limitations of cupping therapy is that it is not applicable in the treatment of internal organ disorders. Even though CAM offers friendly palliative care with low adverse effects in today's world,¹²¹ application of cupping therapy is contraindicated in special patient groups viz. pediatrics, geriatrics, pregnant, and menstruating women.¹⁴

Table 2
Applications of cupping therapy in various pharmacological conditions.

Cupping therapy (拔罐療法 bá guàn liáo fǎ)	Application	References
Wet cupping therapy.	In treatment of chronic idiopathic urticaria and acne vulgaris. (Improving the immune system)	6
	Alleviate current pain in persistent, nonspecific low back pain.	44
	Nonspecific low back pain.	4
	Used in carpal tunnel syndrome but suffers from minor adverse effects like local hematoma.	5
	An effective method of reducing low density lipoprotein cholesterol in men. (Preventive effect against atherosclerosis)	45
	Effective in treatment of herpes zoster.	46
	Treatment of migraine- and stress-associated headaches and postherpetic pain.	47
	An effective role in improving pain, quality of life, and hyperalgesia in chronic nonspecific neck pain.	48
	Remedy for cellulitis (induced by honey bee sting).	49
	Adjuvant treatment for iron overload in treating thalassemia, hemochromatosis, and sideroblastic anemia.	50
Wet cupping therapy with conventional treatments.	Treatment of oral and genital ulceration in patients with Behcet disease.	51
Dry cupping therapy.	In chronic asthmatic bronchitis therapy. (Better curative effects than that of common cupping)	52
A series of five dry cupping therapies.	Relieving chronic nonspecific neck pain. (Influence on functional pain process)	53
Dry cupping therapy with a pulsatile cupping device.	Relieved symptoms of knee osteoarthritis.	12
Dry or/and wet cupping therapy.	Chest pain alleviation.	54
Electroacupuncture (EA) with cupping therapy.	Relieve fatigue of poststroke patients.	55
	Used in vertebral type, nerve root type of cervical spondylopathy and sympathetic type of cervical spondylopathy.	32
EA plus flash cupping therapy.	Synergistic action is obtained in peripheral facial paralysis.	56
EA plus bloodletting puncture and cupping therapy.	Acute gouty arthritis.	57
EA combined with bloodletting and cupping therapy.	A better therapy for herpes zoster.	58
EA combined with moving cupping therapy.	Control target symptoms and improve bad emotion of somatoform disorders.	59
Acupuncture and cupping therapy.	Relieve moderate insomnia.	60
	A rapid relief of hiccup with no toxic side-effects, especially for hiccup due to cerebrovascular accident.	61
	Better therapeutic effect on ankylosing spondylitis than simple acupuncture.	62
	Better than conventional medications for reducing pain and for improving depression scores related to fibromyalgia.	63
Acupuncture, cupping along with acupoint catgut embedding therapy.	Increase therapeutic effect on simple obesity of stomach.	64
Acupuncture, moving cupping, bloodletting puncture.	Treatment of chloasma.	65
Acupuncture-moxibustion combined with cupping therapy.	Treating primary dysmenorrhea.	66
Laser acupuncture plus soft cupping.	Effective on lower back pain.	36
Medicinal cupping therapy followed by acupuncture with cupping therapy.	Reduction in fibromyalgia symptoms.	67,68
Bloodletting cupping therapy (BLC) with herbal medicine.	Treatment of acute gouty arthritis.	69
Bloodletting puncture (BLP) with plum-blossom needle and cupping therapy.	Alleviated acute articular soft tissue injury.	70
BLP, BLC, and external application of Chinese-drug facemask.	Effective in treating acne.	71
BLP and cupping therapy.	Treat neck type of cervical spondylosis.	72
Bloodletting with cupping therapy.	Show effective treatment in asthmatic conditions.	73
Bleeding and cupping therapy.	Postherpetic neuralgia as it can significantly reduce peripheral and local serum P substance.	74
BLC.	Improve clinical condition of rheumatoid arthritis patient and show modulatory effects on natural killer cells and adaptive cellular soluble interleukin-2 receptor.	19
Red-hot needle therapy with BLP and BLC.	Therapeutic effect on neurodermatitis.	75
Clustered needling, massage, and cupping therapy.	Relieve myofascitis of the back.	76
Deep puncture by elongated needle combined with spike-hooked needle and cupping therapy.	Treatment of shoulder periarthritis.	77
Warm needling treatment combined with cupping therapy.	Used in intractable systemma ³ and found more effective when needle inserted on to sciatic nerve.	78
Coiling dragon needling and moving cupping therapy.	Chronic fatigue syndrome treated.	79
Needling and cupping therapy.	Treatment of erysipelas, infection of lower limbs.	80
Pricking blood therapy with three-edged-needle plus cupping.	Good therapeutic effect on Bi-syndrome of wind-dampness type in <i>Yemenia</i> , with more convenience than Arabic <i>Heigama</i> .	81
Warm needling plus cupping therapy.	Treatment of facial paralysis.	82
Pricking, bloodletting and cupping therapy with a three-edge needle.	A definite therapeutic effect on acute eczema.	83
Fire needles at bones combined with cupping therapy and Tuina. ^b	Knee osteoarthritis.	84
Coiling dragon needling and cupping therapy on back.	Positive effect on chronic fatigue syndrome.	85
Plum-blossom needle tapping plus cupping therapy.	Improving periauricular pain, facial, and muscular functions for the treatment of acute facial paralysis.	86
Flash-fire cupping, movable cupping, and fixed cupping in combination.	Improve the pulmonary functions in asthmatic children, especially for those with mild asthma.	87

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Table 2 (continued)

Cupping therapy (拔罐療法 bá guàn liáo fǎ)	Application	References
Fire insertion cupping therapy.	Antipyretic effect in the treatment of fever. (High fever caused by the upper respiratory tract)	88
Flash and wet cupping therapy with acupuncture.	Facial paralysis therapy.	89
A moving flash-fire cupping therapy.	In treatment of urticaria.	90
Cupping therapy with physical exercise.	Effective in reducing pain and improving neck function in musculoskeletal diseases.	91,92
Herbal cupping therapy.	Postherpetic neuralgia treatment.	93
Pneumatic pulsation therapy.	Chronic neck pain.	94
Combined pricking and cupping therapy.	As remedy to herpes zoster, postherpetic neuralgia.	95
Multiple cupping therapies.	Relieving chronic fatigue syndrome.	96
Mild moxibustion combined with cupping therapy.	Eliminating athletic fatigue.	97
Ear point bloodletting combined with cupping.	In treatment of acne vulgaris.	98
Moving cupping at the Hechelu combined with Shenque Bazhenxue moxibustion.	An effective remedy for senile habitual constipation.	99
Cupping therapy with ultrasonography.	A valuable tool in assessing knee effusions. (Especially subclinical levels)	100
Duhuoji sheng Tang ^c alone or combined with cupping therapy.	Effectively improve pain and other clinical symptoms of patients with prolapse of lumbar intervertebral disc.	101
Chinese cupping therapy.	Reduction of symptoms associated with subacute and chronic low back pain.	102
Raktamokshana (Ghati yantra avacharana)	Remove the poison after snake.	103

^a Systemma is a cramp in the muscle of the leg calf.

^b Tuina is a manual technique aimed at enhancing health and treating various clinical conditions.

^c Duhuoji sheng Tang (DHJST) is a traditional Chinese herbal medicine used to treat osteoarthritis.

8. Conclusion

In addition to phytotherapy, CAMs are the real culture specific therapies. They are known to play a pivotal role in the traditional healthcare system. Cupping therapy (拔罐療法 bá guàn liáo fǎ) is a complex therapy having multidimensional roles and benefits in various diseases including acne, herpes zoster, paralysis, and pain management. Detailed studies regarding the cupping therapy mechanisms, supported by well-designed scientific studies, would help in the safe and effective application of the cupping therapies. Outlining the application frequency and cup specifications would further improve its efficacy and diminish the related risk. In order to open new therapeutic avenues in the field of health and medicine, we have to establish a synergistic relationship between conventional therapies and other complementary and alternative therapies.

Conflicts of interest

Authors report no conflict of interest.

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